# Space Weather Forecast

Issued on Friday, 06 January 2023 at 01:29 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

## Space Weather Forecast Headline: Chance of Strong solar activity throughout. Chance of Minor Geomagnetic Storm intervals today.

## Analysis of Space Weather Activity over past 24 hours

**Solar Activity:** Solar activity has been Low, with frequent Common class flares. The largest of these was from a sunspot region that has emerged onto the southeast limb through the period, and is currently the largest on the disc and potentially one of the most magnetically complex. This will be clarified once the region rotates further onto the visible disc. This region, along with at least two of the remaining five sunspot regions on the visible disc, has the potential to produce significant flares.

**Solar Wind / Geomagnetic Activity**: Solar winds started at background levels but then jumped to slightly elevated ,and briefly elevated levels, through the evening. Magnetic field strength was initially at strong levels due to the residual influence of the CME which arrived on the 4th. The important north-south component was at Weak to Moderate levels. Geomagnetic activity has been Quiet to Unsettled throughout.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

## Four-Day Space Weather Forecast Summary

**Solar Activity:** Solar activity is likely to be Low to Moderate, with a chance of strong flares through the forecast period.

**Solar Wind / Geomagnetic Activity:** The effects of a CME which arrived at Earth on 04 January are expected to continue to subside over the next 12 hours. A CME may glance Earth today, but with low confidence. A weak high speed stream, from either coronal hole 60 or 61 is likely to persist today, then declining thereafter. Geomagnetic activity is expected to be Quiet to Unsettled today, with isolated Active periods likely, and a slight chance of a minor geomagnetic storm. From tomorrow (7th) predominantly Quiet conditions are expected.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. However, there is a slight chance of these rising in response to any larger flares that may occur, and perhaps exceeding the S1/Minor Radiation storm level.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 20 | 5 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 50 | 50 | 50 | 50 |
| Very Active | R3 to R5 X | No | 20 | 20 | 20 | 20 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 10 | 10 | 20 | 20 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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